

FORM PTO-1449 TO BE FILED WITH INFORMATION DISCLOSURE STATEMENT

U.S. Department of Commerce

Coriol N

Attv. Docket No.: OSU1159-166B

Patent and Trademark Office

Serial No.: 10/649,046

SUPPLEMENTAL INFORMATION

Filing Date: August 27, 2003
Applicant: Berger

DISCLOSURE STATEMENT

Group Art Unit: 2811

BY APPLICANTS

Examiner: Nadav

OTHER DOCUMENTS

1. Amlani, I. et al., Digital Logic Gate Using Quantum-Dot Cellular Automata, Science, 284, pp. 289-291 (April 9, 1999).

2. Fay, P. et al., Integration of InAs/A1Sb/GaSb Resonant Interband Tunneling

Diodes with Heterostructure Field-Effect Transistors for Ultra-High-Speed Digital Circuit

Applications, IEEE, pp. 162-165 (1999).

3. Fay, P. et al., A New Integrated Laboratory Course for Microwave Circuit Design and Measurements, International Conference on Engineering and Computer Education, Rio de Janeiro, 4 pages (August, 1999).

4. Klimeck, G. et al., Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots, 35 pages (January 7, 2002).

5. Nayak, D. et al., Rapid Thermal Oxidation of GeSi Strained Layers, Appl. Phys. Lett., 56, pp. 66-68 (January 1, 1990).

Examiner	CRANE	Date Considered	8	12005	
	······································				

Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

and

The identification of any document herein is not intended to be, and should not be understood as being, an admission that each such document, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given document may have a later effective date than at first seems apparent or the document may have an effective date which can be antedated. The "prior art" status of any document is a matter to be resolved during prosecution.

CRANE



FORM PTO-1449 TO BE FILED WITH INFORMATION DISCLOSURE STATEMENT

U.S. Department of Commerce

Atty. Docket No.: OSU1159-166B

Patent and Trademark Office

Serial No.: 10/649,046

INFORMATION

Filing Date: August 27, 2003
Applicant: Berger

DISCLOSURE STATEMENT

Group Art Unit: 2811

BY APPLICANTS

Examiner: Not Known

U.S. PATENT DOCUMENTS

Examiner's Initial	Document Number	Date	Name	Class/Sub- class
	NONE		•	

FOREIGN PATENT DOCUMENTS

Examiner's	Document	Date	Country/Name	Translation
initial	Number	•		yes/no
	NONE			

OTHER DOCUMENTS

- 1. Ahn, S.J. et al., Asynchronous analogue-to-digital converter for single-electron circuits, *Electronics Letters*, 34, pp. 172-173 (1998).
- 2. Amlani, I. et al., Demonstration of a six-dot quantum cellular automata system,

 Applied Physics Letters, 72, pp. 2179-2181 (1998).
- 3. Arai, K. et al., Static Frequency Divider Featuring Reduced Circuit Complexity by

 Utilizing Resonant Tunneling Diodes in Combination with HEMT's, IEEE Electron Device

 Letters, 18, pp. 544-546 (1997).
 - 4. Avrutin, V.S. et al., Silicon molecular beam epitaxial growth on ultra-small mesa structures, *Journal of Crystal Growth*, 157, pp. 276-279 (1995).

CRANE

5/2005

(4)

- 5. Ben-Jacob, E. et al., DNA transistor and quantum bit element: Realization of nanobiomolecular logical devices, *Physics Letters A*, 263, pp. 199-202 (1999).
- 6. Bennett, C.H. et al., Mixed-state entanglement and quantum error corrections,

 Physical Review A, 54, pp. 3824-3851 (1996).
- 7. Berger, P.A. et al., Role of strain and growth conditions on the growth front profile of In_xGa_{1-x}As on GaAs during the pseudomorphic growth regime, *Appl. Phys. Letter*, 53, pp. 684-686 (1988).
- 8. Broekaert, T.P.E. et al., A Monolithic 4-Bit 2-Gsps Resonant Tunneling Analog-to-Digital Converter, *IEEE Journal of Solid-State Circuits*, 33, pp. 1342-1349 (1998).
- 9. Chan, H.L. et al., Compact Multiple-Valued Multiplexers Using Negative Differential Resistance Devices, *IEEE Journal of Sold-State Circuits*, 31, pp. 1151-1156 (1996).
- 10. Fay, P. et al., Fabrication of Monolithically-Integrated InA1As/InGaAs/InP HEMTs and InAs/A1Sb/GaSb Resonant Interband Tunneling Diodes, *IEEE Transaction on Electron Devices*, 48, pp. 1282-1284 (2001).
 - 11. Feldheim, D.L. et al., Self-assembly of single electron transistors and related devices, Chemical Society Reviews, 27, pp. 1-12 (1998).
- 12. Fujisawa, T. et al., Resonant tunneling properties of single electron transistors with a novel double-gate geometry, *Appl. Phys. Lett.*, 68, pp. 526-528 (1996).
- 13. Fujiwara, A. et al., Double-Island Single-Electron Devices-A Useful Unit Device for Single-Electron Logic LSI's, *IEEE Transactions on Electron Devices*, 46, pp. 954-959 (1999).
- 14. Fulton, T.A. et al., Observation of Single-Electron Charging Effects in Small Tunnel

 Junctions, *Physical Review Letters*, 59, pp. 109-112 (1987).

CRANG

- 15. Fulton, T.A. et al., Determination of Coulomb-Blockade Resistances and

 Observation of the Tunneling of Single Electrons in Small-Tunnel-Junction Circuits,

 Physical Review Letters, 67, pp. 3148-3151 (1991).
- 16. Hobart, K.D. et al., Growth of low-dimensional structures on nonplanar patterned substrates, *Journal of Crystal Growth*, 157, pp. 338-343 (1995).
- 17. Fukuda, H. et al., Fabrication of silicon nanopillars containing polycrystalline silicon/insulator multilayer structures, *Appl. Phys. Lett.*, 70, pp. 333-335 (1997).
- 18. Jancu, J.M. et al., Empirical *spds** tight-binding calculation for cubic semiconductors: General method and material parameters, *Physical Review B*, 57, pp. 6493-6507 (1998).
- 19. Jin, G. et al., Control of the arrangement of self-organized Ge dots on patterned Si(001) substrates, *Thin Solid Films*, 369, pp. 49-54 (2000).
- 20. Kamins, T.I. et al., Lithographic positioning of self-assembled Ge islands on Si(001), Appl. Phys. Lett., 71, pp. 1201-1203 (1997).
- 21. LeGoue's, F.K. et al., Kinetics and mechanism of oxidation of SiGe: dry versus wet

 (a) Coxidation, Appl. Phys. Lett., 54, pp. 644-646 (1989).3
- 22. LeGoues, F.K. et al., Oxidation studies of SiGe, *J. Appl. Phys.*, 65, pp. 1724-1728, (1989).
- 23. Lent, C.S. et al., Lines of interacting quantum-dot cells: A binary wire, *J. Appl. Phys.*, 74, pp. 6227-6233 (1993).
- 24. Likharev, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, K.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and Their Applications, *Proceedings of the Likharev*, M.K., Single-Electron Devices and M.K., Sin

5 2005

- 25. Liou, H.K., et al. Effects of Ge concentration on SiGe oxidation behavior, *Appl. Phys. Lett.*, 59, pp. 1200-1202 (1991).
- 26. Liu, H.I. et al., Self-limiting oxidation of Si nanowires, *J. Vac. Sci. Technol. B.*, 11(6), pp. 2532-2537 (1993).
- 27. Liu, H.I. et al., Self-limiting oxidation for fabricating sub-5 nm silicon nanowires,

 Appl. Phys. Lett., 64, pp. 1383-1385 (1994).
- 28. Mo, Y.W. et al., Mimetic Pathway in Stranski-Krastanov Growth of Ge on Si(001),

 Physical Review Letters, 65, pp. 1020-1023 (1990).
- 29. Nakazato, K. et al., Single-Electron Memory, *Electronics Letters*, 29, pp. 384-385
- 30. Nayak, D.K. et al., Wet oxidation of GeSi strained layers by rapid thermal processing, *Appl. Phys. Lett.*, 57, pp. 369-371 (1990).
- 31. Orlov, A.O. et al., Realization of a Functional Cell for Quantum-Dot Cellular

 Automata, Science, 277, pp. 928-930 (1997).
- 32. Orlov, A.O. et al., Experimental demonstration of a binary wire for quantum-dot cellular automata, *Applied Physics Letters*, 74, pp. 2875-2877 (1999).
- 33. Pamulapati, J. et al., Realization of In-Situ Sub Two-Dimensional Quantum

 Structures by Strained Layer Growth Phenomena in the In_xGa_{1-x}As/GaAs System,

 Journal of Electronic Materials, 25, pp. 479-483 (1996).
- 34. Pashkin, Y.A. et al., Room-temperature Al single-electron transistor made by electron-beam lithography, *Applied Physics Letters*, 76, pp. 2256-2258 (2000).
- 35. Pooley, D.M. et al., Coulomb blockade in silicon nano-pillars, *Applied Physics*Letters, 74, pp. 2191-2193 (1999).

- 36. Pooley, D.M. et al., Fabrication and electron transport in multilayer silicon-insulator-silicon nanopillars, *J. Vac. Sci. Technol. B.*, 17(6), pp. 3235-3238 (1999).
- 37. Prabhakaran, K. et al., *In situ* oxidation of a thin layer of Ge on Si(001):

 Observation of Ge to SiO₂ transition, *Appl. Phys. Lett.*, 62, pp. 864-866 (1993).
- 38. Prabhakaran, K. et al., Oxidation of Ultrathin SiGe Layer on Si(001): Evidence for Inward Movement of Ge, *Jpn. J. Appl. Phys.*, 33, pp. 1837-1838 (1994).
- 39. Prabhakaran, K. et al., Fabrication of multiperiod Si/SiO₂/Ge layered structure through chemical bond manipulation, *Applied Physics Letters*, 72, pp. 3169-3171 (1998).
- 40. Schittenhelm, P. et al., Photoluminescence study of the crossover from two-dimensional to three-dimensional growth for Ge on Si(100), *Appl. Phys. Lett.*, 67, pp. 1292-1294 (1995).
- 41. Schmidt, O.G. et al., Formation of carbon-induced germanium dots, *Appl. Phys. Lett.*, 71, pp. 2340-2342 (1997).
- 42. Schoelkopf, R.J., The Radio-Frequency Single-Electron Transistor (RF-SET): A
- 43. Seabaugh, A. et al., Resonant Tunneling Circuit Technology: Has it Arrived?, (> IEEE, pp. 119-122 (1997).
- 44. Seabaugh, A. et al., Transistors and Tunnel Diodes For Analog/Mixed-Signal Circuits and Embedded Memory, *IEEE*, pp. 429-432 (1998).
- 45. Shao, X. et al., Strain modification in thin Si_{1-xy}Ge_xC_y alloys on (100) Si for formation of high density and uniformity sized quantum dots, *Journal of Applied Physics*, 85, pp. 578-582 (1999).

- 46. Shen, J. et al., Static Random Access Memories Based on Resonant Interband

 Tunneling Diodes in the InAs/GaSb/A1Sb Material System, IEEE Electron Device

 Letters, 16, pp. 178-180 (1995).
- 47. Shimizu, N. et al., In_{0.53}Ga_{0.47}As/AlAs resonant tunnelling diodes with switching time of 1.5ps, *Electronics Letters*, 31, pp. 1695-1697 (1995).
- 48. Stein, H.J. et al., Hydrogen-accelerated thermal donor formation in Czochralski silicon, *Appl. Phys. Lett.*, 56, pp. 63-65 (1990).
- 49. Sunamura, H. et al., Island formation during growth of Ge on Si(100): A study using photoluminescence spectroscopy, *Appl. Phys. Lett.*, 66, pp. 3024-3026 (1995).
- 50. Takahashi, Y. et al., Size Dependence of the Characteristics of Si Single-Electron Transistors on SIMOX Substrates, *IEEE Transactions on Electron Devices*, 43, pp. 1213-1217 (1996).
- 51. Teichert, C. et al., Self-Organization in Growth of Quantum Dot Superlattices,

 Physical Review Letters, 76, pp. 1675-1678 (1996).
- 52. Tougaw, P.D. et al., Bistable saturation in coupled quantum-dot cells, *J. Appl.*Phys., 74, pp. 3558-3566 (1993).
- 53. Tsukagoshi, K., Operation of logic function in a Coulomb blockade device,

 Applied Physics Letters, 73, pp. 2515-2517 (1998).
- 54. Tucker, J.R., Complementary digital logic based on the "Coulomb blockade", J.

 Appl. Phys., 72, pp. 4399-4413 (1992).
- 55. Usami, N. et al., Realization of crescent-shaped SiGe quantum wire structures on a V-groove patterned Si substrate by gas-source Si molecular beam epitaxy, *Appl. Phys. Lett.*, 63, pp. 2789-2791 (1993).

- 56. van der Wagt, J.PA. et al., RTD/HFET Low Standby Power SRAM Gain Cell,

 IEEE Electron Device Letters, 19, pp. 7-9 (1998).
- 57. van der Wagt, J.P.A., Tunneling-Based SRAM, *Proceedings of the IEEE*, 87, pp. 571-595 (1999).
- 58. Waho, T. et al., Resonant-Tunneling Diode and HEMT Logic Circuits with

 Multiple Thresholds and Multilevel Output, IEEE Journal of Solid-State Circuits, 33, pp. 268-274 (1998).
- 59. Wang, X. et al., Germanium dots with highly uniform size distribution grown on Si(100) substrate by molecular beam epitaxy, *Appl. Phys. Lett.*, 71, pp. 3543-3545 (1997).
- 60. Wei, Y. et al., Controlled growth of SiO₂ tunnel barrier and crystalline Si quantum wells for Si resonant tunneling diodes, J. Appl. Phys., 81, pp. 6415-6424 (1997).
- 61. Wilk, G.D. et al., Electrical Characteristics of High-Quality Sub-25-Å Oxides

 Grown by Ultraviolet Ozone Exposure at Low Temperature, IEEE Electron Device

 Letters, 20, pp. 132-134 (1999).
- 62. Xie, Y.H. et al., Relaxed template for fabricating regularly distributed quantum dot arrays, *Appl. Phys. Lett.*, 71, pp. 3567-3568 (1997).
 - 63. Yano, K. et al., Room-Temperature Single-Electron Memory, *IEEE Transactions*on Electron Devices, 41, pp. 1628-1638 (1994).
 - 64. Yoshikawa, N. et al., Complementary Digital Logic Using Resistively Coupled Single-Electron Transistor, *Jpn. J. Appl. Phys.*, 35, pp. 1140-1145 (1996).
 - 65. Yoshikawa, N. et al., Single Electron Transfer Logic Gate Family, *Jpn. J. Appl. Phys.*, 38, pp. 433-438 (1999).

66. Zhu, J.H. et al., Two-dimensional ordering of self-assembled Ge islands on vicinal Si(001) surfaces with regular ripples, *Applied Physics Letters*, 73, pp. 620-622 (1998).

Examiner	CRANE	Date Considered	5	2005

Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

The identification of any document herein is not intended to be, and should not be understood as being, an admission that each such document, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given document may have a later effective date than at first seems apparent or the document may have an effective date which can be antedated. The "prior art" status of any document is a matter to be resolved during prosecution.